

In re Patent Application of
PAU ET AL.
Serial No. 09/390,554
Filed: 9/3/99

application. Favorable reconsideration is respectfully requested.

I. The Invention

As described in the specification, the disclosed invention is directed to a method and a hardware architecture for calculating the DCT on a plurality of blocks of pixels, in parallel, which provides for the scalability of the size of the blocks of pixels. By virtue of the scalability of the block size and of the ability to calculate the DCT in parallel on more blocks, it is possible, according to the present invention, to implement a fractal coding applied in the DCT domain rather than in the space domain of picture data, as customary.

II. The Claims are Patentable

Claims 5-12 were rejected in view of Zhao and Ericsson et al. (U.S. 5,689,592) for the reasons set forth on pages 2 and 3 of the Office Action. Applicants contend that Claims 5-12 clearly define over the cited references, and in view of the following remarks, favorable reconsideration of the rejection under 35 U.S.C. §103 is requested.

Independent method Claims 5 and 8 at least include defining first subdivision blocks as range blocks, having a fractional and scalable size $N/2^i * N/2^i$, where i is an integer; and calculating, in parallel, the DCT of 2^i range blocks of a domain block. Similarly, independent apparatus Claims 9, 12 and 13 at least include means/unit to define first subdivision blocks as range blocks, having a fractional and scalable size

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$N/2^i * N/2^i$, where i is an integer; and means/unit to calculate in parallel, the DCT of 2^i range blocks of a domain block.

It is these combinations of features which are not fairly taught or suggested in the cited references and which patentably define over the cited references.

The Examiner has relied on the Zhao article as allegedly disclosing various features of the claimed method and apparatus. The Examiner correctly recognized that the Zhao article does not teach parallel calculations. However, the Examiner has relied upon the Ericsson patent as disclosing parallel calculations during image processing.

Firstly, Applicants maintain that the Examiner has misinterpreted the cited reference to Zhao. Specifically, while Zhao does teach the partitioning of the image into blocks, and the use of fractal coding, there is no disclosure of defining subdivision blocks having a fractional and scalable size, as claimed. Indeed, there is no disclosure or teaching of any scalable DCT processing feature.

Furthermore, the Ericsson et al. patent describes the architecture of a logic processing unit of the Single Instruction Multiple Data type, which when included in a CPU may accelerate the execution via software of certain processing algorithms of signals including DCT calculation on blocks of pixels. In the cited paragraphs, Ericsson et al. merely recognize the possibility of speeding up the processing of images by performing certain processing algorithms, including the calculation of a $8*8$ DCT, in parallel on distinct pluralities of digital samples, using a conventional CPU or ALU of a computer (i. e. by software computing).

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Typically, the digital samples belong to distinct blocks of pixels in which an image is divided.

Nothing in Ericsson et al. is suggestive of the method and relative "scalable" architecture for parallel calculation of the DCT of blocks of pixels of different size and compression characteristics of the present invention. In other words, nothing in Ericsson et al. makes up for the deficiencies of the Zhao reference as discussed above.

As the Examiner is aware, to establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim features.

There is simply no teaching or suggestion in the cited references to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicants maintain that the cited references do not disclose or fairly suggest the invention as set forth in Claims 5, 8, 9, 12 and 13. Furthermore, no proper modification of the teachings of these references could result in the invention as claimed. Thus, the rejection under 35 U.S.C. §103(a) should be withdrawn.

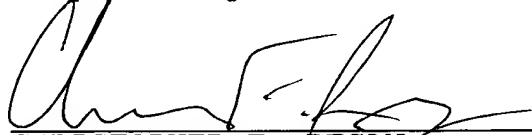
It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

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III. Conclusion

In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining informalities which need to be resolved before the application can be passed to issue, the Examiner is invited and respectfully requested to contact the undersigned by telephone in order to resolve such informalities.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, D.C. 20231, on this 12th day of November, 2002.

